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Attorney Docket # 1979

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: MA et al.

Group Art Unit: 2827

Serial number: 10/020,638

Examiner: MITCHELL, James

Filing date: 14 DEC 2001

Date this response: 24 JUL 2002

Title: DUAL CURE B-STAGEABLE UNDERFILL FOR WAFER LEVEL

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir: This is in response to the Office Action mailed 03 JULY 2002.
Claims 1-12 are pending in the application.
Claims 1,2, 7, and 8 are rejected.
Claims 3-6 and 9-12 are objected to.
Applicants request that the Examiner reconsider this application in light of the below amendment and remarks.
Included with this response are a clean version of the pages containing the amended claims and a marked up version showing changes made of the pages containing the amended claims.

AMENDMENT

Kindly amend claims 1 and 7 as shown below and on the clean version and marked up version of the claim pages.

Support for these amendments can be found in the specification at paragraph [0014] last sentence in which it is stated that *the combination* of the first and second compositions will be referred to as the total B-stageable underfill. Support can also be found in paragraph [0015] in which it is disclosed that the second composition will be a solid or semi-solid material at room temperature, *dispersible or dissolvable either in the liquid first composition, or in the same or a compatible solvent for the first composition*. From this it can be inferred that the first and second compositions are used in combination.

1. (amended_ A silicon wafer having a B-stageable underfill material deposited on one face of the wafer, the B-stageable underfill comprising a combination of two chemical compositions, a first composition and a second composition, having curing temperatures or curing temperature ranges sufficiently separated to allow the composition with the lower curing temperature, the first composition, to cure without curing the composition with the higher curing temperature, the second composition, characterized in that the first composition has been cured and the second composition is uncured.
7. (amended) A B-stageable underfill composition comprising comprising a combination of two chemical compositions, a first composition and a second composition, having curing temperatures or curing temperature ranges sufficiently separated to allow the composition with the lower curing temperature, the first composition, to cure without curing the composition with the higher curing temperature, the second composition.

REMARKS

The Examiner has rejected claims 1, 2, 7, and 8 under 35 USC 102(e) as being anticipated by Hirai, US 6,388,321. Applicants respectfully traverse.

The Examiner states that Hirai discloses a wafer having a B-stageable underfill comprising two chemical compositions having curing temperatures sufficiently separated to allow the composition with the lower curing temperature to cure without curing the second composition. Although this is true, the Hirai compositions are not used in combination. One of the Hirai compositions (the anisotropic conductive film) is used to create a frame or a wall shape into which is filled the second composition (the epoxy resin). See, for example, the abstract, column 2 lines 14 to 17, and column 3 lines 17 to 20.

Applicants have amended their claims to clarify that their underfill is a combination of two compositions, not two compositions used separately as in Hirai. Applicants believe that these amendments and remarks obviate the rejection and request that the Examiner remove the rejection on 102 (b) grounds.

The Examiner cited 35 USC 103(a). Inasmuch as no claims have been canceled, this citation does not need to be addressed at this time.

Applicants thank the Examiner for acknowledging the allowable subject matter, and believe that all claims are now in condition for allowance.

Should the Examiner wish to address any issues by telephone, he is invited to telephone the undersigned attorney.

Respectfully submitted,



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